

Recd 10/21/02
O IPE

WHAT IS CLAIMED

8. (Twice Amended) A rotary piston continuous flow dynamic displacement expansible chamber device comprising a hollow toroid cylinder housing or stator with a smooth inner surface surrounding a rotor rotably mounted utilizing an attached balanced central shaft as a rotational axis, with one or a plurality of balanced pistons mounted radially on said rotor within said cylinder, an intake port with means for the attachment of an obliquely mounted intake manifold or port housing, said oblique angle relative to part of the outside circumference of the toroid cylinder, a movable conformably shaped and sized pivoting valve mounted near the opening of said intake port but before the flow channel of the accumulator where the flow converges with said piston and cylinder assembly prior to the top seal point said expansible chamber formed between said rotor, piston, smooth inner surface of the toroid cylinder, said accumulator port area and said valve, said valve does not ever fully close off said intake port because the fluid flows over said valve and piston in said accumulator combustor area said valve merely isolates the piston and flow from a retrograde course to the exhaust port by closing behind said piston immediately after said piston passes the area of said pivoting valve thereby providing continuous rotary yet compartmentalized positive displacement from a compound single cycle rotary device, said valve with no external control also known as free acting or floating action a form of direct contact or mechanical interaction between the moving piston back and the valve face in its very simplest configuration said piston can act directly on the valve pushing it out of the way, said flow

19

having the opposite effect on said valve pushing said valve in the opposite direction towards said sloped piston back, and said rotor thereby sealing the flow within the expandable chamber forcing it to move the pistons and turn the rotor before said fluid can travel through to the exhaust port said exhaust port with means for the attachment of an obliquely angled exhaust pipe or manifold said oblique angle relative to said toroid cylinder or stator housing for evacuating the working fluid after it has been used.

9. (Twice Amended) A rotary piston continuous flow dynamic displacement expandible chamber device according to claim 8, wherein said pistons have a plurality of piston rings mounted in grooves of said pistons.

10. (Twice Amended) A rotary piston continuous flow dynamic displacement expandible chamber device according to claim 9, wherein said valve and actuator are spring loaded to keep the valve pressed against said rotor and said sloped piston backs as well as said piston head so that as the said pistons travel through or under the valve said valve is maintained against said surfaces even in the absence of fluid flow.

11. (Twice Amended) An internal continuous combustion rotary engine comprising A rotary piston continuous flow dynamic displacement

expansible chamber device comprising a hollow toroid cylinder housing or stator with a smooth inner surface surrounding a rotor rotably mounted utilizing an attached balanced central shaft as a rotational axis, one or a plurality of balanced pistons mounted radially on said rotor within said cylinder, an intake port with means for the attachment of an obliquely mounted port housing, said oblique angle relative to part of the outside circumference of the toroid cylinder, said intake port housing with means for the attachment of an obliquely mounted combustor relative to part of the outside circumference of said toroid cylinder containing an inner reaction cage which is a type of concentric precombustion chamber that produces controlled concentric or stratified flashover combustion a type of twice oxidized concentric combustion, thus said combustor having the ability of an instant two step passive compression process that is achieved by the novel design of its combustor and its components said inner reaction cage or precombustion chamber in which a rich mixture is ignited as said combustion expands to the outside of said reaction cage but still within the combustor more air is added to this rich ignited mixture and said mixture is leaned while burning, convergence of the flow into the cylinder area as well as reductions to its neck or nozzle by the accumulator and/or valve shield, and/or diffuser of said combustor further compress the mixture said combustor with means for attachment of supply lines supplying said combustor with fuel and air and means for igniting said mixture, said combustion providing both a pressurized force and an impinging or impacting force on said pistons, said impinging force and overall device efficiency enhanced by the design incorporating oblique

angles, a movable conformably shaped and sized pivoting valve mounted near the opening of said combustor and said intake port but before the flow channel of the accumulator where the flow converges with said piston and cylinder assembly prior to the top seal point said expansible chamber formed between said rotor, piston, smooth inner surface of the toroid cylinder, said accumulator port area and said valve, said valve does not ever fully close off said intake port because the fluid flows over said valve and piston in said accumulator combustor area said valve merely isolates the piston and flow from a retrograde course to the exhaust port by closing behind said piston immediately after said piston passes the area of said pivoting valve, thereby providing continuous rotary yet compartmentalized positive displacement from a compound single cycle rotary device, said valve with no external control also known as free acting or floating action a form of direct contact or mechanical interaction between the moving piston back and the valve face in its very simplest configuration said piston can act directly on the valve pushing it out of the way, said flow or combustion having the opposite effect on said valve pushing said valve in the opposite direction towards said sloped piston back, and said rotor thereby sealing the flow within the expandable chamber forcing it to move the pistons and turn the rotor before said fluid can travel through to the exhaust port said exhaust port with means for the attachment of an obliquely angled exhaust pipe or manifold said oblique angle relative to said toroid cylinder or stator housing for evacuating the working fluid after it has been used.

12. (Twice Amended) A rotary piston internal continuous combustion

dynamic displacement engine according to claim 11, wherein said pistons have a plurality of piston rings mounted in the ring grooves of said pistons said pistons having concave tops.

13. (Twice Amended) A rotary piston internal continuous combustion dynamic displacement engine according to claim 11, wherein said obliquely angled exhaust pipe or manifold has means for attaching and powering a turbo charger. Said turbocharger augmented in its start up function by a pressurized air canister or tank for supplying start up air for combustion negating the need for an electric starter.

14. (Twice Amended) A rotary piston internal continuous combustion dynamic displacement engine according to claim 11, wherein said valve and actuator are spring loaded to keep the valve pressed against said rotor and said sloped piston backs as well as said piston head so that as the said pistons travel through or under the valve said valve is maintained against said surfaces even in the absence of combustion or flow

15. (Twice Amended) A rotary piston internal continuous combustion dynamic displacement engine according to claim 12, wherein said toroid cylinder housing comprises water jackets and water cooling systems with means for attachment of steam extracting fittings and means for extracting steam from the process of cooling said engine and its components and utilizing said steam to aid in the process of power

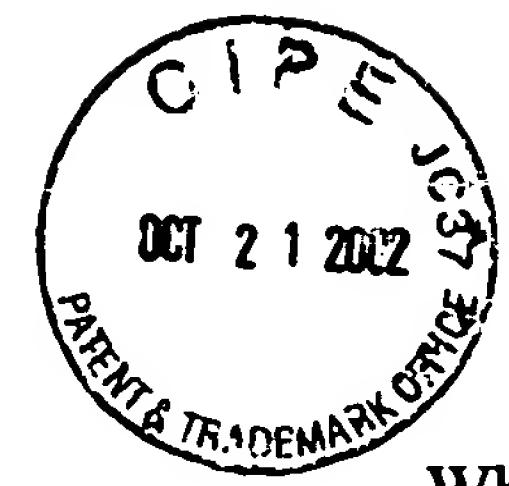
production either in the way and means of reintroduction of this steam
into the combustor helping push the pistons or in a separate isolated
process and additional device that imparts power to the common
central shaft with means for the attachment of tubing and fittings to
recovering said steam, cooling it, phase changing it back into liquid,
circulating and reusing it.

16. (Twice Amended) An internal continuous combustion rotary
engine according to claim 11 wherein said valve has means for the
attachment of external controls said control comprising valve pivot
assemblies with means for attachment to external control levers and
rotating cams that are in synchronization with the rotation of the rotor
and pistons Said lever rides on said external cam that as it turns raises
and lowers the valve in synchronization with the approaching and
passing of the pistons allowing the piston through yet immediately
closing after it passes thus isolating said piston and said combustion
confining them to the expandible chamber forcing said flow to push
said piston until it reaches the exhaust port and discharges

17. A rotary piston continuous flow dynamic displacement expandible
chamber device according to claim 8, wherein said valve has
means for the attachment of external controls said control
comprising valve pivot assemblies with means for attachment to
external control levers and rotating cams that are in
synchronization with the rotation of the rotor and pistons Said

lever rides on said external cam that as it turns raises and lowers
the valve in synchronization with the approaching and passing of
the pistons allowing the piston through yet immediately closing
after it passes thus isolating said piston and said combustion
confining them to the expandible chamber forcing said flow to
push said piston until it reaches the exhaust port and discharges

18. A rotary piston continuous flow dynamic displacement
expandible chamber device according to claim 9, wherein said
valve has means for the attachment of external controls said
control comprising valve pivot assemblies with means for
attachment to external control levers and rotating cams that are in
synchronization with the rotation of the rotor and pistons Said
lever rides on said external cam that as it turns raises and lowers
the valve in synchronization with the approaching and passing of
the pistons allowing the piston through yet immediately closing
after it passes thus isolating said piston and said combustion
confining them to the expandible chamber forcing said flow to
push said piston until it reaches the exhaust port and discharges



RECEIVED

OCT 24 2002

TECHNOLOGY CENTER R3700

What is claimed:

8. (Twice Amended) A rotary piston continuous flow dynamic displacement expandable chamber device comprising a hollow toroid cylinder housing or stator with a smooth inner surface surrounding a rotor rotably mounted utilizing an attached balanced central shaft as a rotational axis, with one or a plurality of balanced pistons mounted radially on said rotor within said cylinder, an intake port with means for the attachment of an obliquely mounted intake manifold or port housing, said oblique angle relative to part of the outside circumference of the toroid cylinder, a movable conformably shaped and sized pivoting valve mounted near the opening of said intake port but before the flow channel of the accumulator where the flow converges with said piston and cylinder assembly prior to the top seal point said expandable chamber formed between said rotor, piston, smooth inner surface of the toroid cylinder, said accumulator port area and said valve, said valve does not ever fully close off said intake port because the fluid flows over said valve and piston in said accumulator combustor area said valve merely isolates the piston and flow from a retrograde course to the exhaust port by closing behind said piston immediately after said piston passes the area of said pivoting valve thereby providing continuous rotary yet compartmentalized positive displacement from a compound single cycle rotary device, said valve with no external control also known as free acting or floating action a form of direct contact or mechanical interaction between the moving piston back and the valve

face in its very simplest configuration said piston can act directly on the valve pushing it out of the way, said flow having the opposite effect on said valve pushing said valve in the opposite direction towards said sloped piston back, and said rotor thereby sealing the flow within the expandable chamber forcing it to move the pistons and turn the rotor before said fluid can travel through to the exhaust port said exhaust port with means for the attachment of an obliquely angled exhaust pipe or manifold said oblique angle relative to said toroid cylinder or stator housing for evacuating the working fluid after it has been used.

9. (Twice Amended) A rotary piston continuous flow dynamic displacement expansible chamber device according to claim 8, wherein said pistons have a plurality of piston rings mounted in grooves of said pistons.

10. (Twice Amended) A rotary piston continuous flow dynamic displacement expansible chamber device according to claim 9, wherein said valve and actuator are spring loaded to keep the valve pressed against said rotor and said sloped piston backs as well as said piston head so that as the said pistons travel through or under the valve said valve is maintained against said surfaces even in the absence of fluid flow.

11. (Twice Amended) An internal continuous combustion rotary engine comprising A rotary piston continuous flow dynamic displacement expandible chamber device comprising a hollow toroid cylinder housing or stator with a smooth inner surface surrounding a rotor rotably mounted utilizing an attached balanced central shaft as a rotational axis, one or a plurality of balanced pistons mounted radially on said rotor within said cylinder, an intake port with means for the attachment of an obliquely mounted port housing, said oblique angle relative to part of the outside circumference of the toroid cylinder, said intake port housing with means for the attachment of an obliquely mounted combustor relative to part of the outside circumference of said toroid cylinder containing an inner reaction cage which is a type of concentric precombustion chamber that produces controlled concentric or stratified flashover combustion a type of twice oxidized concentric combustion, thus said combustor having the ability of an instant two step passive compression process that is achieved by the novel design of its combustor and its components said inner reaction cage or precombustion chamber in which a rich mixture is ignited as said combustion expands to the outside of said reaction cage but still within the combustor more air is added to this rich ignited mixture and said mixture is leaned while burning, convergence of the flow into the cylinder area as well as reductions to its neck or nozzle by the accumulator and/or valve shield, and/or diffuser of said combustor further compress the mixture said combustor with means for attachment of supply lines supplying said combustor with fuel and air and means for igniting said mixture, said combustion providing both a pressurized force and an impinging or impacting force on said pistons, said impinging force and

overall device efficiency enhanced by the design incorporating oblique angles, a movable conformably shaped and sized pivoting valve mounted near the opening of said combustor and said intake port but before the flow channel of the accumulator where the flow converges with said piston and cylinder assembly prior to the top seal point said expandable chamber formed between said rotor, piston, smooth inner surface of the toroid cylinder, said accumulator port area and said valve, said valve does not ever fully close off said intake port because the fluid flows over said valve and piston in said accumulator combustor area said valve merely isolates the piston and flow from a retrograde course to the exhaust port by closing behind said piston immediately after said piston passes the area of said pivoting valve, thereby providing continuous rotary yet compartmentalized positive displacement from a compound single cycle rotary device, said valve with no external control also known as free acting or floating action a form of direct contact or mechanical interaction between the moving piston back and the valve face in its very simplest configuration said piston can act directly on the valve pushing it out of the way, said flow or combustion having the opposite effect on said valve pushing said valve in the opposite direction towards said sloped piston back, and said rotor thereby sealing the flow within the expandable chamber forcing it to move the pistons and turn the rotor before said fluid can travel through to the exhaust port said exhaust port with means for the attachment of an obliquely angled exhaust pipe or manifold said oblique angle relative to said toroid cylinder or stator housing for evacuating the working fluid after it has been used.

12. (Twice Amended) A rotary piston internal continuous combustion dynamic displacement engine according to claim 11, wherein said pistons have a plurality of piston rings mounted in the ring grooves of said pistons said pistons having concave tops.

13. (Twice Amended) A rotary piston internal continuous combustion dynamic displacement engine according to claim 11, wherein said obliquely angled exhaust pipe or manifold has means for attaching and powering a turbo charger. Said turbocharger augmented in its start up function by a pressurized air canister or tank for supplying start up air for combustion negating the need for an electric starter.

14. (Twice Amended) A rotary piston internal continuous combustion dynamic displacement engine according to claim 11, wherein said valve and actuator are spring loaded to keep the valve pressed against said rotor and said sloped piston backs as well as said piston head so that as the said pistons travel through or under the valve said valve is maintained against said surfaces even in the absence of combustion or flow

15. (Twice Amended) A rotary piston internal continuous combustion dynamic displacement engine according to claim 12, wherein said toroid cylinder housing comprises water jackets and water cooling systems with means for attachment of steam extracting fittings and means for extracting steam from the process

ABSTRACT OF THE DISCLOSURE

A revolving piston rotary toroid cylinder valved continuous combustion or flow expandable chamber devices, compressor and engine machine system with an outer toroid cylinder housing assembly having a central axis, having one or a plurality of balanced pistons with means for attachment to a rotor and radiating through the outer rotor assembly to contact or come within close tolerance of the interior surface of the outer housing at the other extreme of the pistons, whereby, a plurality of relatively air tight compartments are formed between the interior surface of the outer housing, the outer surface of the rotor assembly and the piston or plurality of pistons with the volume of said compartment varying as a function of the rotative position of the inner cylinder and rotor assembly in relation to the isolating valve. The rotary device can be used as a compressor having a inlet for receiving air and an outlet for providing compressed air. The rotary device can also have an inlet for receiving working fluid and an exhaust port for venting working fluid, a combustor for burning combustible fluids. The combustor can also heat an expansion gas or fluid, which is introduced and or mixed within the combustor simultaneously.

of cooling said engine and its components and utilizing said steam to aid in the process of power production either in the way and means of reintroduction of this steam into the combustor helping push the pistons or in a separate isolated process and additional device that imparts power to the common central shaft with means for the attachment of tubing and fittings to recovering said steam, cooling it, phase changing it back into liquid, circulating and reusing it.

16. (Twice Amended) An internal continuous combustion rotary engine according to claim 11 wherein said valve has means for the attachment of external controls said control comprising valve pivot assemblies with means for attachment to external control levers and rotating cams that are in synchronization with the rotation of the rotor and pistons Said lever rides on said external cam that as it turns raises and lowers the valve in synchronization with the approaching and passing of the pistons allowing the piston through yet immediately closing after it passes thus isolating said piston and said combustion confining them to the expandible chamber forcing said flow to push said piston until it reaches the exhaust port and discharges

17. A rotary piston continuous flow dynamic displacement expandible chamber device according to claim 8, wherein said valve has means for the attachment of external controls said control comprising valve pivot assemblies with means for

attachment to external control levers and rotating cams that are in synchronization with the rotation of the rotor and pistons Said lever rides on said external cam that as it turns raises and lowers the valve in synchronization with the approaching and passing of the pistons allowing the piston through yet immediately closing after it passes thus isolating said piston and said combustion confining them to the expandible chamber forcing said flow to push said piston until it reaches the exhaust port and discharges

18. A rotary piston continuous flow dynamic displacement expandible chamber device according to claim 9, wherein said valve has means for the attachment of external controls said control comprising valve pivot assemblies with means for attachment to external control levers and rotating cams that are in synchronization with the rotation of the rotor and pistons Said lever rides on said external cam that as it turns raises and lowers the valve in synchronization with the approaching and passing of the pistons allowing the piston through yet immediately closing after it passes thus isolating said piston and said combustion confining them to the expandible chamber forcing said flow to push said piston until it reaches the exhaust port and discharges